Office of Technical Assistance Research Proposal

Low-Acid Use in Metal Pointing

BACKGROUND

Pointing is a process used in the metal shaping industry to apply specific shapes to the end of a piece of metal, usually steel or aluminum. Various pointing techniques have been developed over the years to improve efficiency and to keep up with the increasing number of shapes desired by manufacturers. Among these techniques are acid and electrochemical shaping, as well as various mechanical methods including cold roll pointing, tensile breaking, and hand grinding.

Acid shaping requires the use of strong acids (sulfuric, hydrochloric, etc.) to be efficient, and is the technique of choice for precision pointing on irregularly shaped metals. Often times this shaping is done by hand and requires a large amount of acid. Electrochemical pointing, using a combination of weaker acids and an applied voltage across the metal, can be substituted in some cases but not all. The metal shaping industry is eager to find new methods of precision pointing that lower the amount of strong acids needed to achieve their results, not only because many manufacturers must report on their acid use, but also because the presence of these highly corrosive substances are a serious danger in the workplace. Also, neutralization of these acids in the effluent often requires significant amounts of sodium hydroxide.

SCOPE of PROBLEM

There are a handful of manufacturers in Massachusetts that do acid pointing, most of them in the western part of the state. Extrapolating the available TURA data to the acid pointing sector, the potential use of strong acids and sodium hydroxide in pointing processes, organized by Standard Industrial Classification numbers, is as follows:

SIC code	No. of Companies	HCl use, lbs	Nitric acid use, lbs	NaOH use, lbs	Products Manufactured
3315	2	73,940		51,750	Steel wire, nails and related products
3316	7	98,108	167,389	247,615	Cold steel products
TOTALS	9	172,048	167,389	299,355	

While acid pointing does not represent a large portion of the state's toxics use, the environmental impact of the industry is nonetheless significant. As such, any advance in acid shaping technology or the development of new pointing methods that do not require acid would be desirable, especially as such an advance would also render unnecessary the need for sodium hydroxide as a pH stabilizer.

PROGRAM OBJECTIVE

This project would require an evaluation of current acid pointing techniques and their particular physical specifications, perhaps in the form of a technical review article. This could possibly be done as an undergraduate or graduate project, in which case OTA would be open to offering technical support and guidance. Refinements to existing acid pointing methods should subsequently be explored, as well as the possible development of new pointing technologies. Also, other existing pointing techniques should be considered for their possible application to irregular metal shapes.

OTA knows of at least one company that is interested in an industry partnership.